



## Summary

### Experimental Small Area Household Wealth Estimates

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#### EXPERIMENTAL SMALL AREA HOUSEHOLD WEALTH ESTIMATES

##### Introduction

Experimental modelled estimates of mean household net worth for small areas are available on the Downloads tab in the following data cube: Experimental small area household wealth estimates, 2015-16.

They are based on data from the 2015-16 Survey of Income and Housing (SIH), 2016 Australian Census of Population and Housing, 2016 Estimated Resident Population (ERP), and various administrative data.

For more information on SIH 2015-16, please see the User Guide (cat. no. 6503.0).

##### Modelled estimates

The modelled estimates are created from the most preferred model subject to available data. It is unlikely that all determinants of worth will be available as good quality small area data to allow inclusion in the model selection process. For example, superannuation is not included in the initial set of explanatory variables to use in modelling because this data is not available at small area level. There may be other variables that could add additional information about household net worth that aren't able to be included for this reason. This should be considered when using and interpreting the experimental mean household net worth estimates.

The variables chosen in the model may result in incorrect modelled estimates for certain small areas, particularly those unusual small areas that do not follow the typical associations between the available predictor variables and net worth.

Therefore, the modelled estimates can be interpreted as the expected value for a typical area in Australia with the same characteristics. It is important to consider local area knowledge that could impact on the mean net worth within a small area of interest when interpreting the modelled estimates for that area.

The ABS recommends that these experimental small area estimates be used for comparison between small areas only, as opposed to using the figures as estimates of mean household net worth amounts.

A full list of available explanatory variables considered for this project, and those that were significant and included in the model, are available within the data cube.

##### Experimental estimates

The modelled estimates should be considered experimental. The ABS welcomes feedback on the quality and usefulness of the estimates, particularly that which could improve any future iterations of this research.

The estimates were produced using a Generalised Linear Mixed Model (GLMM) method using a gamma distribution and log link function. Whilst the ABS has released estimates created using the GLMM method previously, this is the first ABS release using this combination of distribution and link function.

##### Net Worth (Wealth)

Net worth (or wealth) refers to economic resources in the form of the balance of assets and liabilities held by members of a household.

An asset can be viewed as a store of value that provides a benefit or series of benefits accruing to the economic owner by holding or using the asset over a period of time. Assets may be financial or non-financial.

Financial assets include:

- accounts in financial institutions, such as bank deposits and offset accounts
- superannuation accounts
- listed and unlisted shares and trusts
- the value of own unincorporated businesses
- the outstanding value of loans made to persons in other households or to businesses.

Non-financial assets include:

- residential and non-residential properties and land, not part of an unincorporated business
- consumer durables that are used repeatedly and for more than one year, such as vehicles, household furniture and appliances, clothes and other personal items
- art work and other collectibles
- intangible fixed assets such as intellectual property and computer software.

A liability is established when one unit (the debtor) is obliged, under specific circumstances, to provide a payment or series of payments to another unit (the creditor). All liabilities are financial in nature, and for all financial assets held by a household there is a corresponding liability held by another party.

Liabilities are primarily the value of loans outstanding including:

- mortgages
- borrowings from other households
- investment loans
- credit card debt
- debt on other loans such as personal loans to purchase vehicles, and study loans.

Net worth is calculated as the difference between the stock of household assets and the stock of household liabilities.

## **Population groups**

The SIH collects information by personal interview from usual residents of private dwellings in urban and rural areas of Australia (excluding Very Remote areas), covering about 97% of the people living in Australia. The small area estimates created align to the same population.

## **Geography**

Estimates have been produced for SA2, SA3 and SA4 boundaries (2016 ASGS) and LGA boundaries (2019).

## **Methodology**

To produce estimates of net worth at the small area level, a model was created using the detailed SIH data, in conjunction with the Census data, ERP, and other administrative data to produce modelled estimates for small areas. The method assumes that the relationships observed at the higher geographic level (as available in SIH) between the characteristic of interest (net worth) and known household characteristics also hold at the small area level.

The preparation of explanatory or predictor variables is a critical aspect of small area estimation. Although limited by the data that is available, there is a wide range of demographic and socio-economic variables that can be sourced from the survey, Census of Population and Housing and administrative datasets.

As the model is predicting household outcomes, household predictors were set up from household, family and person level data. Family/person level information can be summarised for each household e.g. households where the highest educational attainment is a Bachelor Degree or Higher.

## **Reliability of estimates**

The errors associated with the modelled estimates for small areas fall into four categories: sampling error, non-

sampling error, modelling error, and prediction error. The relative root mean squared error (RRMSE) provides an indication of the deviation of the modelled estimate from the true value. The RRMSE is primarily a measure of prediction error, but in its calculation it also inherits some aspects of modelling and sampling error.

As a general rule of thumb, estimates with RRMSEs less than 25% are considered reliable for most purposes, estimates with RRMSEs between 25% and 50% should be used with caution and estimates with RRMSEs greater than 50% are considered too unreliable for general use.

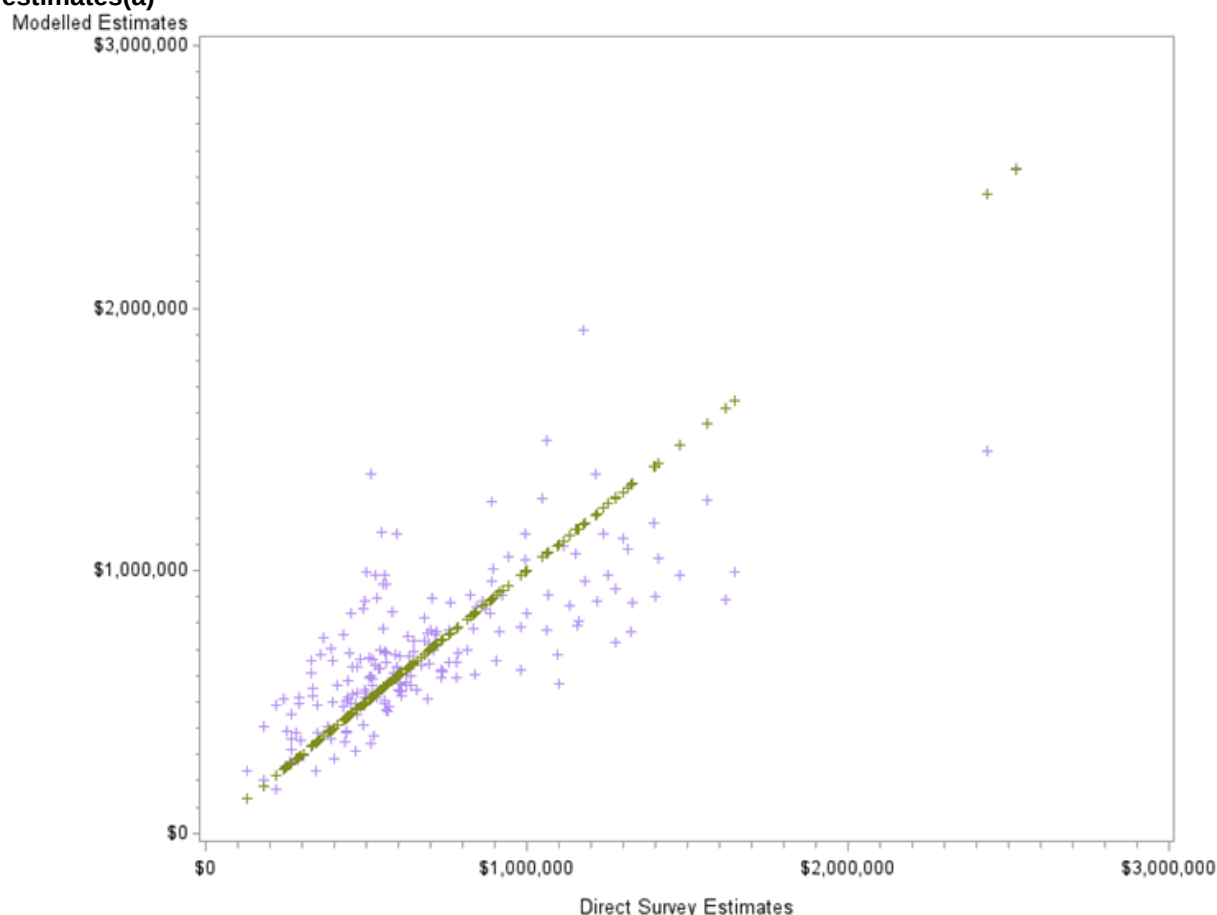
### Bias of estimates

Analysis of the small area estimates compared to direct survey estimates reveal that the small area estimates appear to slightly overestimate mean net worth for lower net worth areas and slightly underestimate mean net worth for higher net worth areas, as shown in Graph 1.

The diagonal line in Graph 1 is representative of when the small area estimates match the direct survey estimates exactly. The purple crosses are the small area estimates. For an unbiased set of small area estimates compared to the direct survey estimates it would be expected that there would be a random distribution of purple crosses around the diagonal line. Instead, a slightly higher density of purple crosses can be seen above the diagonal for lower net worth values (compared to below the diagonal) and then as the net worth values increase there is slightly more density below the line compared to above.

Due to the apparent bias, the ABS recommends that the small area estimates should be used for comparative purposes between small areas as opposed to using the figures as exact measures of household net worth.

**Graph 1 STATISTICAL AREA LEVEL 2 (SA2) AVERAGE NET WORTH, modelled estimates vs direct survey estimates(a)**



**Footnote(s):** (a) Direct survey estimates are from the 2015-16 Survey of Income and Housing (SIH).

### Areas not available

Some small area estimates are not available for publication. Areas with a large percentage of population out of scope of the SIH or with a small number of households were excluded. Additional areas deemed to have low quality estimates were also excluded; the impact is that the minimum value for each geography is higher than it would be if these areas weren't excluded.

### SA3 and SA4 errors

In the interests of minimising computational load, the error calculations for SA3s and SA4s were derived from the SA2 errors. As a result, the errors for the SA3s and SA4s will be slightly lower than if they had been calculated directly.

### **Confidentiality and aggregation**

Estimates have been confidentialised to ensure they meet ABS requirements for confidentiality.

Because SIH population benchmarks have been used in the modelling process, the modelled estimates provided here can also be considered perturbed. Users should note that due to perturbation, the summing, or aggregation, of the modelled estimates to derive totals (e.g. a state total) will not necessarily give the same result as corresponding published totals. In these cases, the difference between the sum of modelled estimates for small areas and the published total will be small and will not impact the overall information value of the aggregate total or any individual component.

Aggregation of the modelled estimates of small areas to capital city or state/territory level is not recommended though. If you require capital city or state/territory level estimates, the appropriate source is published survey data also available from the Downloads tab or from available survey microdata products (cat. no. 6540.0).